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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,342	11/26/2001	Michael Scott Lamphere	13DV13913	9845

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EXAMINER	
WILKINS III, HARRY D	

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/994,342	LAMPHERE ET AL.	
	Examiner	Art Unit	
	Harry D. Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 11-15 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruns et al (US 4,851,090) in view of Hunter et al (US 5,641,391) and Mitsuharu (JP 02-145217).

Bruns et al teach (see abstract and Figures 1-18) a method of and apparatus for electrochemically machining a blisk.

Regarding claim 1, the method includes steps of mounting the blisk in a multiaxis electrochemical machine, followed by electrochemically machining a first row of blades. Thus, Bruns et al fail to teach performing a second electrochemical machining to create a second row of blades while the blisk is still mounted in the machine.

However:

(1) Hunter et al teach (see col. 10, lines 4-12) that using multiple electrodes allows increased speed of fabrication and allowing for multiple electrode geometries. Thus, the advantage of using multiple electrodes is increased efficiency and the ability to electrochemically machine two shapes while the part is not removed from the machine. Hunter et al is considered reasonably pertinent to the problem because

Hunter et al relate to simultaneous formation of two different geometries in electrolytic etching (i.e.-machining).

(2) Mitsuharu teaches (see abstract and figures) a method where two electrodes are used to electric discharge machine a single part by having independent movement of the two electrodes. Mitsuharu is considered reasonably pertinent to the problem because Mistuharu teaches an apparatus capable of performing two types of machining of blades on a single blisk.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a second step of electrochemical machining as taught by Mitsuharu to the method of Bruns et al without removing the blisk from the machine for the purpose of increased efficiency and allowing different machined geometries as taught by Hunter et al.

Regarding claim 11, the apparatus includes means for mounting the blisk and means for electrochemically machining a row of blades. Thus, Bruns et al fail to teach a means for electrochemically machining a second row of blades while the blisk is still mounted in the machine.

However:

(1) Hunter et al teach (see col. 10, lines 4-12) that using multiple electrodes allows increased speed of fabrication and allowing for multiple electrode geometries. Thus, the advantage of using multiple electrodes is increased efficiency and the ability to electrochemically machine two shapes while the part is not removed from the machine.

(2) Mitsuharu teaches (see abstract and figures) a method where two electrodes are used to electrochemically machine a single part by having independent movement of the two electrodes.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a second means for electrochemical machining as taught by Mitsuharu to the apparatus of Bruns et al without removing the blisk from the machine for the purpose of increased efficiency and allowing different machined geometries as taught by Hunter et al.

Regarding claims 2 and 12, Bruns et al teach moving the blisk into a pair of electrodes. However, Bruns et al does not teach using two pairs of electrodes. Therefore, it would have been obvious to one of ordinary skill in the art to have added either a second step or second means for moving the blisk into the second pair of electrodes as taught by Hunter et al and Mitsuharu because the second movement means would allow for easily moving the blisk into position to be machined by the second electrodes.

Regarding claim 13, it would have been within the expected skill of a routineer in the art to have set the two machining electrodes in different locations (planes) within the machine as the apparatus itself is bulky and it would be highly difficult to arrange the second means such that it would not interfere with the first means. By setting up the two means in different planes relative to each other, a routineer in the art would have added means for translating the position of the blisk from one means to the other.

Regarding claim 14, it would have been within the expected skill of a routineer in the art to have set up the two machining electrodes to be movable into communication with a fixed blisk because each machining electrode means is bulky and would interfere with the other means. Thus, each of the machining electrodes would require translating means.

Regarding claim 15, Bruns et al teach (see col. 5, lines 1-19) rotating the electrodes during machining. Thus, Bruns et al disclose means for rotating the electrode pairs during machining.

Regarding claim 18, Bruns et al teach means for mounting the blisk and a pair of electrode tools with means for translating the tools in two axes and rotating about a third. However, Bruns et al do not teach the second pair of electrodes with translating/rotating means nor the means for translating the blisk from one electrode tool to the other. Hunter et al and Mitsuharu, as above, teach duplicating the electrode tool to increase efficiency and allow for multiple, different geometries to be machined without additional set-up. Thus, by duplicating the electrode tool, there would be a second means for translating the tools in two axes and rotating about a third. In order to space the two electrode tools sufficiently far apart to allow for the blisk to be placed in the machine, one of ordinary skill in the art would have been motivated to have included a means for translating the blisk along a "seventh" axis towards each of the two electrode tools.

Regarding claim 19, the apparatus of Bruns et al included means (24) for rotating the blisk to sequentially position the blades between the electrodes. It would have been

within the expected skill of a routineer in the art to have set up the two machining electrodes in different locations (planes) within the machine as the apparatus itself is bulky and it would be highly difficult to arrange the second means such that it would not interfere with the first means. By setting up the two means in different planes relative to each other, a routineer in the art would have added means for translating the position of the blisk from one means to the other.

Regarding claim 20, Bruns et al teach a method comprising electrochemically machining a first row of blades. However, Hunter et al and Mitsuharu, as above, teach adding a second set of electrode tools to machine a second row of blades without removing the blisk from the machine and without "re-setting up" the tools between the two sequences. One of ordinary skill in the art would have found it obvious to perform the known "set-up" process for both sets of tools at the same time instead of performing a "reset-up" process after the end of the first machining step.

3. Claims 3-10, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruns et al in view of Hunter et al and Mitsuharu as applied to claims 1, 2, 11-15 and 18-20 above, and further in view of Applicant's admission of prior art.

The teachings of Bruns et al in view of Hunter et al and Mitsuharu are described above.

These references do not teach the claimed method of setting up the machine.

Regarding claims 3 and 17, Applicant admits as prior art (see paragraphs 12-14) that the steps of setting up the apparatus of Bruns et al includes a first machining step on a scrap blisk (i.e.-sample), removing the blisk to inspect for dimensional tolerances

and comparing the dimensions to the desired final dimensions. These steps are repeated until the blisk achieves the final desired dimensions. The next step is mounting the production blisk in the machine and machining it. Therefore, it would have been obvious to a routineer in the art to have operated the two electrode pair machine in the same manner by first machining two rows of blades on a scrap blisk by using the two sets of electrodes and proceeding until the desired final dimensions were achieved.

Regarding claims 4 and 8, it would have been within the expected skill of a routineer in the art to have set the two machining electrodes in different locations (planes) within the machine as the apparatus itself is bulky and it would be highly difficult to arrange the second means such that it would not interfere with the first means. By setting up the two means in different planes relative to each other, a routineer in the art would have added means for translating the position of the blisk from one means to the other.

Regarding claim 5, it would have been within the expected skill of a routineer in the art to have set up the two machining electrodes to be movable into communication with a fixed blisk because each machining electrode means is bulky and would interfere with the other means. Thus, each of the machining electrodes would require translating means.

Regarding claim 6, Bruns et al teach (see col. 5, lines 1-19) rotating the electrodes during machining. Thus, Bruns et al disclose means for rotating the electrode pairs during machining.

Regarding claim 7 and 16, Applicant admits as prior art (see paragraph 15) that in tandem blisks, the two rows of blades have different sizes and configurations. Thus, it would have been obvious to set up the first machining electrodes to create the first row of blades and to set up the second machining electrodes to create the second row of blades in order to independently optimize the processing of each row of blades.

Regarding claims 9 and 10, Applicant admits (see paragraph 12) that the test blisk could be either the production blisk (i.e.-blisk sample is the same as the tandem blisk) or a scrap blisk (i.e.-blisk sample is a different part than the tandem blisk).

Response to Arguments

4. Applicant's arguments filed 29 March 2005 have been fully considered but they are not persuasive. Applicant has argued that:

a. Hunter et al and Mitsuharu are not analogous art.

In response, the Examiner disagrees. Mitsuharu is most definitely analogous art because it is related to a similar method of forming a blisk wherein the two types of machining are performed by a single apparatus by using two sets of machining elements (see figures 1-3). Hunter et al is related to either electrolytic deposition or electrolytic etching. Electrolytic etching is a synonym for electrochemical machining. Thus, Hunter et al is within the field of Applicant's endeavor. Proof that electrochemical etching is the same as electrochemical machining can be seen in Tyler et al (US 3,755,127) at col. 1, lines 22-28.

b. The Examiner fails to provide any sort of technical or logical nexus between the references.

In response, the Examiner respectfully disagrees. The concept of adding a second set of machining electrodes was known in the prior art as shown by Mitsuharu and Hunter et al. The technical and logical nexus between Mitsuharu and Hunter et al with the Bruns et al reference is that increased efficiency can be achieved by adding multiple sets of machining electrodes into a processing apparatus to perform two different geometric machining steps so that the apparatus does not have to be re-setup for machining the second geometric shape.

c. Hunter et al teach simultaneous etching, not in series.

In response, as can be seen from figures 1-3 of Mitsuharu, the first machining step occurs on one side of the blisk. The blisk is rotated such that the second machining is performed after the first machining step. The use of multiple electrodes in Hunter et al shows that the use of more than one electrode can provide savings in time when etching/machining multiple geometries, such as in the tandem blisk of Bruns et al or Mitsuharu. Whether the two electrodes are used at the same time or in series is not relevant as it has been held that the splitting of one step into two was obvious to one of ordinary skill in the art. See *In re First National City Bank* 168 USPQ 180 (BPAI 1970).

d. Bruns et al do not teach two directions of movement as per present claims 2 and 12.

In response, when duplicating the electrodes of Bruns et al, one of ordinary skill in the art would have made the translating device of Bruns et al capable of additional movement to translate the blisk from the first set of machining electrodes to the second

set of machining electrodes, which would thereby provide movement in a second direction.

e. The prior art does not teach offsetting the two pairs of electrodes in different planes.

In response, it has been held that rearrangement of parts in an apparatus is obvious to one of ordinary skill in the art absent a showing that the rearrangement produces an unexpected result. Applicant has not demonstrated that the placement of the two sets of electrodes in different planes produces a new and unexpected result. See MPEP 2144.04.VI.C.

f. "Why modify Bruns et al in the first place, when it already works well enough on single blisks as well as tandem blisks?"

In response, the reason for modifying the reference is that increased efficiency can be achieved by modifying the apparatus/method by duplicating the machining electrode of Bruns et al. The increased efficiency comes from being able to machine both sets of blades in a tandem blisk without having to remove the blisk from the machine and change the set-up of the electrodes to machine the second set of blades. Hunter et al teaches this.

g. The Examiner's reference to part 54 of Bruns et al is erroneous.

In response, while 54 is indeed a seal, the part 24 (which arrows denoting parts 24 and 54 appear adjacent to each other and may be confused) appears and provides rotation of the blisk around axis B. The general location of the rotating means was

indicated by the Examiner and it would be well apparent to one of ordinary skill in the art that rotating means were provided by Bruns et al.

With respect to Applicant's other arguments and issues raised, the Examiner feels that these grounds have been adequately addressed in the rejection grounds above.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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